

(PCT Article 36 and Rule 70)

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002417

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-53 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 1-15 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 16-24 received by this Authority on 13.10.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets fig. 1-24 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-24	YES
	Claims		NO
Inventive step (IS)	Claims	4, 15, 20, 23, 24	YES
	Claims	1-3, 5-14, 16-19, 21, 22	NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p>Document 1: JP 2002-526655 A (The Regents of the University of California), 20 August 2002, paragraphs [0005] to [0031]</p> <p>Document 2: JP 04-041689 A (Mitsubishi Heavy Industries, Ltd.), 12 February 1992, page 2, upper right column, line 1 to page 3, upper right column, line 2; and fig. 1</p> <p>Document 3: JP 11-139803 A (Osaka Gas Co., Ltd.), 25 May 1999, paragraphs [0003] and [0011] to [0013]</p> <p>Document 4: JP 04-350188 A (Japan Atomic Energy Research Institute), 04 December 1992, entire text</p> <p>The inventions set forth in claims 1, 13, 16 and 22 do not involve an inventive step in the light of document 1. The optimization of the temperature is merely a simple design matter.</p> <p>The inventions set forth in claims 2, 3, 5, 6, 17, 18 and 19 do not involve an inventive step in the light of documents 1 and 2. It would have been easy for a person skilled in the art to conceive of modifying the high-temperature steam electrolysis method disclosed in document 1 so that the temperature is increased by means of a heat exchange technique, like in the invention</p>			

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

disclosed in document 2. Furthermore, the selection of the heat source to be used in such a configuration is merely a simple design matter.

The invention set forth in claim 7 does not involve an inventive step in the light of documents 1 and 2. The optimization of the electrolysis voltage is merely a simple design matter.

The invention set forth in claim 8 does not involve an inventive step in the light of documents 1 to 3. It would have been easy for a person skilled in the art to conceive of modifying the high-temperature steam electrolysis method disclosed in document 1 so that the sulfur content of the gas is decreased to a level of 1 ppb by volume or lower, like in the invention disclosed in document 3.

The inventions set forth in claims 9 to 12 and 21 do not involve an inventive step in the light of documents 1 to 3. The selection of a suitable reducing gas is merely a simple design matter.

The invention set forth in claim 14 does not involve an inventive step in the light of document 1. Devices for reacting gasses, wherein the operating conditions are optimized by means of a flow rate control valve, are well known.

Meanwhile, document 4 merely discloses a steam electrolysis method wherein carbon monoxide is employed in order to reduce the consumption of power.

On the other hand, the inventions set forth in claims 4, 15, 20, 23 and 24 are not disclosed in any of the documents that are cited in the international search report, and would not have been obvious to a person skilled in the art.

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## Box No. VI Certain documents cited

## 1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
<b>JP 2004-060041 A</b>	<b>26.02.2004</b>	<b>25.07.2002</b>	<b>25.07.2002</b>
<b>[E, X]</b>			

## 2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 7 includes the wording "necessary energy."

However, the definition of the phrase in question is unclear.